AMENDMENTS TO THE SPECIFICATION

Please amend the specification as follows:

Please amend paragraph [0052] to read as follows:

The hydrogen separation membrane used in Example 1 was a Pd-alloy (Ag, Ta, V, etc.) thin film of 1 μm or less with a high surface area. The Pd-alloy film is supported on a porous ceramic matrix that acts as the mechanical support and a filtration medium to prevent coke from covering the membrane. The porous ceramic support also acts as an insulator to reduce heat losses from the reactor. It also keeps the membrane at the specified temperature for optimum performance and stability. This special design geometry is highly efficient. The permeability used for the base case is $7.8\ 10^{-2}$ ~~std-$m^3/m^2/s/Bar^{0.5}$~~ std-m^3/m^2-s-$Bar^{0.5}$ which is a number 2-30 times higher than reported in the literature (see Table 2).

Please amend Table 2 on page 32 to read as follows:

Permeability, ~~$sm^3/m^2/s/Bar^{0.5}$~~ sm^3/m^2-s-$Bar^{0.5}$	**Membrane Type**	**Source**	**Relative Factor (corrected to 500°C)**
0.00307 (400 °C)	Pd-coated Ta tubes, 50 μm tube wall thickness	REB Research commercial literature	0.53
0.0045 (600 °C)	Pd layer of 5 μm	Souleimanova et. al, Journal of Membrane Science, 166/2, 249 (2000).	0.66
0.00445 (400 °C)	Pd-Cu alloy at 25 μm film	Oremet-Wah Chang (commercial literature)	1.00
0.00556 (350 °C)	Pd-Ag on PSS 316L at 11.7 μm	Prof. Ed Ma, seminar abstract and patent WO 99/30806	1.45

	film with Fe_2O_3 layer		
0.00815 (350 °C)	Pd-Ag on ceramic at 4 μm film	ECN non-confidential personal communication	2.13
0.00604 (300°C)	10-15 μm Pd	Walter Juda et al., US 6,103,028	1.88
0.0104 (420 °C)	Pd-coated Ta tubes, 70 μm Ta tube wall thickness, 3-10 μm Pd thickness	Buxbaum, R.E. et al, Hydrogen transport through tubular membranes of palladium-coated tantalum and niobium, Ind. Engng Chem Res, 35, 530-537, 1996	2.21
0.0204 (520 °C)	Pd layer of 3 μm	Yeung et al., Studies in Surface Science and Catalysis, 101, 1996.	3.45
0.042 (350°C)	Pd layer of 4 μm on ceramic tube	Haldor-Topsoe-4th Intl. Conf. On Catalysis in Membrane Reactors-2000; abstract and paper	10.9
0.078 (500 °C)	Pd alloy ≤1 μm thick	Assumed in Examples 1&2	13.7

Please amend paragraph [0075] to read as follows:

The critical parameter in the simulation results is the value of the membrane permeability. This is calculated according to Richardson's or Sievert's law:

$$D = a\frac{A}{t}(p_1^{0.5} - p_2^{0.5})\exp(-\frac{b}{RT})$$

where:

D is the hydrogen permeation rate in std-m^3/s

A is the membrane effective surface area in m^2

p_1, p_2 are the reactor and permeate partial pressures of hydrogen in Bara

t is the thickness of the membrane in m

T is the membrane temperature in K

R is the ideal gas constant in J/kmol/K

a, b are empirical constants dependent on the material of the membrane

Thus, the factor $\alpha/t*exp(-b/RT)$ is considered to describe the permeability in ~~std-m^3/m^2/s/Bar$^{0.5}$~~ std-m^3/m^2-s-Bar$^{0.5}$ and shows the sole dependence on the material composition and the temperature. The equation above indicates that the rate-limiting step in the transport of hydrogen across the Pd film is the atomic diffusion in the solid.

Please amend paragraph [0076] as follows:

The hydrogen separation membrane in our simulations is a Pd-alloy (Ag, Ta, V, etc.) thin film of 1 μm with a high surface area exposed to the reactor side. The Pd-alloy film is supported on a porous ceramic matrix that acts as the mechanical support, filtration medium to prevent coke from covering the film, and an insulator to reduce heat losses from the reactor. It also keeps the membrane at the specified temperature for optimum performance and stability. This special design geometry is highly efficient. The permeability used for the base case is $7.8\ 10^{-2}$ ~~std-m^3/m^2/s/Bar$^{0.5}$~~ std-m^3/m^2-s-Bar$^{0.5}$.